

REMARKS

Claims 14-29 are pending in the present application. No claims have been amended or cancelled. Therefore, Claims 14-29 remain pending in the application.

Reexamination of the application and reconsideration of the rejections are respectfully requested in view of the following remarks, which follow the order set forth in the Office Action.

Rejections under 35 U.S.C. § 103(a) are traversed.

Claims 14-20 and 22-29 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Japanese patent 2001049414 (Endo et al., [sic, Hidekazu et al.], hereinafter “Endo”) in view of U.S. Patent No. 4,713,153 to Adriaensen et al., (hereinafter “Adriaensen”) in further view of Andre, U.S. Patent No. 6,009,912 (hereinafter “Andre”). Applicants respectfully traverse the rejection for the following reasons.

Claim 14 recites a process for the preparation of a steel surface for hot-dip galvanising in a zinc based molten bath, comprising the steps of cleaning the surface by electrocleaning, ultrasonic cleaning, or brush cleaning, pickling the surface, and applying a protective layer to the surface by immersion in a flux solution, wherein the cleaning is performed to a level of less than $0.6 \mu\text{g}/\text{cm}^2$ residual dirt, and the flux solution comprises a soluble bismuth compound. Claims 15-20 and 26 are dependent therefrom.

Claim 22 recites a process for single-dip galvanising of a steel surface using an aluminum containing molten zinc bath, comprising the steps of cleaning the surface by electrocleaning, ultrasonic cleaning, or brush cleaning, pickling the surface, applying a protective layer to the surface by immersion in a flux solution, and galvanising the surface by single-dipping the surface in an aluminum containing molten zinc bath, where the cleaning is performed to a level of less than $0.6 \mu\text{g}/\text{cm}^2$ residual dirt, and the flux solution comprises a soluble bismuth compound. Claims 23-25 and 27-29 are dependent therefrom.

Endo (translated abstract) recites a flux for a hot dip zinc-magnesium-aluminum base alloy coating for a steel surface. Endo recites “degreasing and pickling of the steel sheet surface and drying aqueous treating liquid stuck on the steel surface after dipping into the aqueous treating liquid of the flux, and successively, dipping into Zn-Mg-Al base alloy bath.” The flux may contain ZnCl , NH_4Cl and one or more of alkali or alkali earth metal salts and one or more Sn, Pb, In, Tl, Sb or Bi chlorides. Endo does not disclose or suggest a level of

cleanliness of the steel surface. Endo further does not disclose or suggest surface cleaning by electrocleaning or ultrasonic cleaning or brush cleaning.

Adriaensen discloses a process for cleaning by electrochemical pickling. The electrolytic pickling process utilizes an alternating electrolyzing current to provide wires having surfaces of improved cleanliness. (*Col. 2, lines 48-56*). Adriaensen lacks any disclosure regarding galvanizing, cleaning to a certain level, applying a protective layer or using a flux containing bismuth.

Andre discloses a metal pipe with an integrally formed polymer liner for use in corrosive and abrasive environments. The liner is formed by first applying a comparatively thin monolayer or multilayer polymer/adhesive film to the metal pipe surface during a pre-treatment process in order to facilitate bonding of a subsequently extruded low density polyethylene/linear low density polyethylene blend. (*Col. 3, lines 56-61*). The Andre patent discloses a process of forming the metal pipe commencing with the steps of pre-washing *galvanized* coil strip steel to initially remove any residual oil and dirt. (*Col 5, lines 17-22*). The Andre patent discloses that the galvanized metal may be subsequently processed in a high pressure hot alkaline spray bath to remove any residual dirt or oils and then rinsed with high pressure hot water sprayed upon both surfaces of the metal. (*Col 5, lines 22-25*). Andre is silent as to a particular level of cleanliness required for a galvanised steel surface and equally silent as to a particular level of cleanliness required for a steel surface prior to galvanising. Andre further lacks any disclosure regarding preparing a steel surface for hot-dip galvanising or a process for single-dip galvanising.

To establish a prima facie case of obviousness, three requirements must be satisfied. First, the prior art relied upon, coupled with the knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or to combine references. *See In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988); *In re Skinner*, 2 USPQ2d 1788, 1790 (BPAI 1986).

Second, the proposed modification of the prior art must have had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. In other words, a hindsight analysis is not allowed. *See Amgen, Inc. v. Chugai Pharm. Co.*, 927 F.2d 1200, 18 USPQ2d 1016, 1023 (Fed. Cir. 1991). And the teachings or suggestions, as well as the expectation of success, must come from the prior art,

not applicant's disclosure. *See In re Vaeck*, 947 F.2d 488, 493, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991).

Lastly, the prior art reference or combination of references must teach or suggest the limitations of the claims. *See In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (C.C.P.A. 1970) ("All words in a claim must be considered in judging the patentability of that claim against the prior art.").

The inadequacy of the combination of Endo and Adriaensen is described in the last response. Andre has now been cited to remedy the alleged deficiencies of the combination of Endo and Adriaensen. The Office Action states that "Andre discloses cleaning performed to a level of less than 0.6 $\mu\text{g}/\text{cm}^2$ residual dirt (col 5, lines 23-25; "any")." *Office action mailed March 14, 2006, page 3.*

However, Andre is not the same subject matter as the invention as defined in the rejected claims or as the other cited art. The Andre patent is concerned with polymer coatings on galvanized steel and not the art of galvanizing steel surfaces. The Andre patent cannot, therefore, reasonably be related to the problems of galvanizing steel surfaces. Andre lacks any disclosure or suggestion of galvanizing, cleaning to a certain level, applying a protective layer or using a flux containing bismuth. Thus, motivation to combine the teachings of Andre with either Endo and/or Adriaensen is lacking. Therefore, the Andre patent, alone or in combination with Endo and Adriaensen, cannot serve as a basis for the rejection. "In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992).

Moreover, even if the combination were permitted, the assertion in the Office Action that the Andre patent cures the deficiency in the combination of Endo and Adriaensen patent by disclosing cleaning to a level "to remove any residual dirt or oils" (*col 5, lines 23-25*; "any") is respectfully traversed by Applicants. "Any" is not indicative of a specific level, or of all dirt. The Andre patent, alone or in combination, does not provide one of ordinary skill in the art a particular level of cleanliness for excellent galvanized coatings, nor does the mentioning of removing any dirt provide one with a level of cleanliness to provide excellent galvanized coatings. "It is this invention *as a whole*, and not some part of it, which must be obvious under 35 U.S.C. 103." *In re Papesch*, 50 CCPA 1276, 315 F.2d 381, 137 USPQ 43 (1963) (emphasis in original).

Applicants direct the Examiner's attention to the following disclosures in the instant specification:

- “[s]amples which were not properly cleaned (with an amount of soil corresponding to 1 or 2 $\mu\text{g}/\text{cm}^2$) and which therefore had water breaks on the surface demonstrated pinholes in Galfan coatings and bad adhesion after treatment with a Bi containing flux.” *page 4, lines 24-27*;
- “. . . whenever the proper surface cleaning had not taken place . . . the coating quality was severely deteriorated by the presence of pinholes and bad coating adhesion.” *page 12, lines 6-9*; and
- “. . . the combination of proper cleaning procedures and the use of a bismuth containing flux guarantees that the coatings obtained in a single dip Galfan bath are of excellent quality.” *page 12, lines 10-12*.

The combination of a level of cleanliness and a bismuth containing flux solution are not disclosed or suggested in the combination of Endo, Adriaensen and Andre. Thus, in the absence of all of the elements of the claim being recited among the combination of Endo in view of Adriaensen and further in view of Andre, there cannot be any suggestion to combine the said documents or any likelihood of success upon their combination. Therefore, the requirements for a prima facie case of obviousness are not met. Withdrawal and reconsideration of the rejection is respectfully requested.

Claim 21 was rejected under 35 U.S.C. 103(a) as being unpatentable over Endo in view of Adriaensen in further view of Andre, and further in view of British patent 896,866 (hereinafter “Boller”). Applicants respectfully traverse the rejection for the following reasons.

Claim 21 recites the elements of claims 14 and claim 19 wherein the flux solution further comprises at least 7 wt% NH_4Cl and further comprises between 15 and 35 wt% ZnCl_2 .

Boller discloses a process for applying a protective coating to ferrous articles which comprises first plating the ferrous surface with a non-ferrous metal having a low solubility in liquid aluminum and then applying a hot-dipped aluminum or aluminum alloy coating. The process disclosed by Boller requires exposure of the steel to a galvanic coating bath (21), a fused alkali chloride bath (22) and finally a molten aluminum or alloy bath (24). Boller is silent as to a level of surface cleanliness.

The Office Action asserts that Boller satisfies the deficiency in the combination of Endo and Adriaensen in view of Andre by disclosing a flux solution between 15-35 wt% of ZnCl_2 (*p* 4, *lines* 5-15). However, there is no mention or suggestion of a level of cleanliness less than $0.6 \mu\text{g}/\text{cm}^2$ in Boller or in the combination of Boller with Endo in view of Adriaensen or in view of Andre for the reasons recited above.


As the combination of the above cited documents is silent as to the level of cleanliness of less than $0.6 \mu\text{g}/\text{cm}^2$ residual dirt, as in dependent claim 21, and because the combination of documents fail to disclose or suggest a level of cleanliness in combination with a bismuth containing flux, all the elements recited in claim 21 have not been found in the cited documents. In the absence of all of the elements of the claim being recited among the combination of documents, any suggestion to combine the said documents is lacking, and any likelihood of success from such a combination is lacking. Thus, the requirements for a prima facie case of obviousness are not met. Therefore, withdrawal and reconsideration of the rejection is respectfully requested.

For the foregoing reasons, claims 14-29 are considered allowable. A Notice to this effect is respectfully requested. If any questions remain, the Examiner is invited to contact the undersigned at the number given below.

Respectfully submitted,

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